AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of encoding information symbols for multiple antennae transmission comprising the steps of:

generating a code matrix B_0;

generating a transformation matrix L ~~where~~ based on an auto-correlation of a channel estimate; and

combining the code matrix B_0 with the transformation matrix L to obtain a result B for controlling the amount of beamforming relative to the amount of orthogonal coding in signals transmitted from the multiple antennae.

2. (Currently Amended) The method of claim 1 wherein the transformation matrix L is a matrix such that [[, when]] the conjugate transpose of L [[is]] multiplied by L generates a desired correlation matrix Φ.

3. (Original) The method of claim 2 wherein the code matrix B_0 is orthogonal.

4. (Currently Amended) A method of encoding information symbols for multiple antennae transmission comprising the steps of:

generating a code matrix B_0;

generating a transformation matrix L based on an auto-correlation of a channel estimate, where L satisfies the relationship $\Phi = L^H L$, and where Φ is a desired correlation matrix [[Φ]]; and

combining the code matrix B_0 with the transformation matrix L to obtain a result B for controlling the amount of beamforming relative to the amount of orthogonal coding in signals transmitted from the multiple antennae.

5. (Original) The method of claim 4 wherein the desired correlation matrix is comprised of at least one correlation parameter λ.

6. (Original) The method of claim 5 wherein the transformation matrix L is the matrix square root of the desired correlation matrix Φ.

7. (Original) The method of claim 4 wherein blocks of symbols of a serial data stream of user data are encoded with an orthogonal code to form code matrix B0.

8. (Currently Amended) A method of [[generation]] <u>generating</u> signals for transmitting from at least two antennae of a wireless communications system comprising the steps of:

feeding a stream of incoming information symbols to an encoder;

feeding a signal representative of a beamforming weight parameter to the encoder to modify the stream of information symbols;

<u>determining a code correlation parameter (λ) based on an auto-correlation of a channel estimate;</u>

feeding [[a]] <u>the</u> code correlation parameter (λ) to the encoder to control the proportion of orthogonal coding relative to beamforming of the stream of information symbols that are to be transmitted; and

feeding the stream of information symbols modified by the code correlation parameter to at least two antennae for transmission.

9. (Original) The method of claim 8 wherein the code correlation parameter determines the correlation of the encoded signals to the different antennae.

10. (Original) The method of claim 9 wherein the signal representative of the beamforming weight parameter represents a complex number having a magnitude and a phase.

11. (Currently Amended) The method of claim 9 wherein the signal representative of the beamforming weight parameter is [[of]] a real number <u>portion</u> of <u>a</u> [[the]] phase of the beamforming weight parameter.

12. (Currently Amended) The method of claim 11 wherein the code correlation parameter is [[of]] a real number <u>that</u> can vary between a first value and a second value.

13. (Original) The method of claim 12 wherein one of the values represents orthogonal coding with no beamforming and the other value represents beamforming with no orthogonal coding, and

intermediate values represent a combination of orthogonal coding and beamforming.

14. (Original) The method of claim 9 wherein, in a duplex communication system having a forward and reverse link, the code correlation parameter is determined from signals received on the reverse link.

15. (Original) The method of claim 14 further comprising the step of determining a channel correlation coefficient (ρ) from the signals received on the reverse link.

16. (Original) The method of claim 15 wherein the channel correlation coefficient (ρ) is a complex number from which the magnitude component and not the phase component is used to determine the code correlation parameter λ.

17. (Currently Amended) The method of claim <u>15</u> [[14]] wherein the channel correlation coefficient is an estimate of <u>an</u> auto-correlation coefficient of channel gain from an antenna for a fixed time delay.

18. (Currently Amended) The method of claim 17 wherein the delay is determined by the difference between the time at which feedback information is transmitted on the reverse link to the time at which the beamforming weight parameter computed using that information is applied by <u>a</u> [[the]] forward link transmitter.

19. (Original) The method of claim 18 wherein the delay is equal to the time difference multiplied by the ratio of carrier frequencies on the reverse and forward links.

20. (Currently Amended) The method of claim 8 wherein the [[symbol]] signal transmitted by each antenna at each symbol time is the sum of one or more signals, each of which is proportional to the product of one of the incoming <u>information</u> symbols and their complex conjugates and their negations and their negations of their complex conjugates, with a number that is determined by <u>the code correlation parameter (λ)</u> [[lambda]].

21. (Currently Amended) A method of forming a signal comprising the steps of:

obtaining at least two component signals;

<u>determining first and second complex numbers based upon an autocorrelation of a channel estimate;</u>

multiplying a first component signal by [[a]] <u>the</u> first complex number to obtain a first signal;

multiplying a second component signal by [[a]] <u>the</u> second complex number to obtain a second signal;

wherein the phases of the first and second complex numbers are unequal; and subtracting the second signal from the first signal to obtain a first composite signal for transmission by a first antenna element during a first transmit period.

22. (Currently Amended) A method of forming signals for transmission from an antenna element during two transmit periods comprising the steps of:

obtaining at least two component signals for each transmit period;

multiplying a first component signal by a first complex number to obtain a first signal;

multiplying a second component signal by a second complex number to obtain a second signal[[;]], wherein the phases of the first and second complex numbers are unequal;

subtracting the second signal from the first signal to obtain a first composite signal for transmission by the first antenna element during a first transmit period;

multiplying a third component signal by [[a]] the second complex number to obtain a third signal;

multiplying a fourth component signal by [[a]] the first complex number to obtain a fourth signal; and

adding the third signal to the fourth signal to obtain a second composite signal for transmission by the antenna element during a second transmit period.

23. (Currently Amended) A method of forming signals for transmission from two antenna elements during two transmit periods comprising the steps of:

obtaining at least two component signals for each antenna for each time interval;

multiplying a first component signal by a first complex number to obtain a first signal;

multiplying a second component signal by a second complex number to obtain a second signal[[;]], wherein the phases of the first and second complex numbers are unequal;

subtracting the second signal from the first signal to obtain a first composite signal for transmission by a first antenna element during a first transmit period;

multiplying a third component signal by [[a]] the second complex number to obtain a third signal;

multiplying a fourth component signal by the first complex number to obtain a fourth signal;

adding the third signal to the fourth signal to obtain a second composite signal for transmission by the first antenna element during a second transmit period;

multiplying the first component signal by a third complex number to obtain a fifth signal;

multiplying the second component signal by a fourth complex number to obtain a sixth [[fourth]] signal[[;]], wherein the phases of the third and fourth complex numbers are unequal;

adding the fifth [[third]] signal to the sixth [[fourth]] signal to obtain a third composite signal for transmission by the second antenna element during the first transmit period;

multiplying the third component signal by the fourth complex number to obtain a seventh [[fifth]] signal;

multiplying the fourth component signal by the third [[their]] complex number [[numbers]] to obtain [[a sixth]] an 8th signal;

~~wherein the fifth and sixth complex numbers are unequal;~~ and

subtracting the seventh [[fifth]] signal from the 8th [[sixth]] signal to obtain a fourth composite signal for transmission by the second antenna element during the second transmit period.

24. (Original) The method of claim 23 wherein the component signals are determined by at least one incoming information symbol and at least one of the component signals is related to a code correlation parameter.

25. (Original) The method of claim 24 wherein each component signal is related to at least one of two information symbols, or their negations, or their complex conjugates or the negations of their complex conjugates.

26. (Currently Amended) A method of forming a signal comprising the steps of:

obtaining at least two component signals;

determining first and second phases based upon an autocorrelation of a channel estimate;

applying [[a]] the first phase to a first component signal to obtain a first signal;

applying [[a]] the second phase to a second component signal to obtain a second signal[[;]], wherein the first and second phases are unequal; and

combining the second signal and the first signal to obtain a first composite signal for transmission by a first antenna element during a first transmit period.

27. (Currently Amended) A method of forming signals for transmission from an antenna element during two transmit periods comprising the steps of:

obtaining at least two component signals for each transmit period;

applying a first phase to a first component signal to obtain a first signal;

applying a second phase to a second component signal to obtain a second signal[[;]], wherein the first and second phases are unequal;

combining the second signal and the first signal to obtain a first composite signal for transmission by the first antenna element during a first transmit period;

applying [[a]] the second phase to a third component signal to obtain a third signal;

applying [[a]] the first phase to a fourth component signal to obtain a fourth signal; and

combining the third signal and the fourth signal to obtain a second composite signal for transmission by the antenna element during a second transmit period.

28. (Currently Amended) A method of forming signals for transmission from two antenna elements during two time intervals comprising the steps of:

obtaining at least two component signals for each antenna for each time interval;

applying a first phase to a first component signal to obtain a first signal;

applying a second phase to a second component signal to obtain a second signal[[;]], wherein the first and second phases are unequal;

combining the second signal and the first signal to obtain a first composite signal for transmission by a first antenna element during a first time interval;

applying the second phase to a third component signal to obtain a third signal;

applying the first phase to a fourth component signal to obtain a fourth signal;

combining the third signal and the fourth signal to obtain a second composite signal for transmission by the first antenna element during a second time interval;

applying a third phase to the first component signal to obtain a fifth signal;

applying a fourth phase to the second component signal to obtain a <u>sixth</u> [[fourth]] signal[[;]], wherein third and fourth phases are unequal;

combining the <u>fifth and sixth</u> ~~third and fourth~~ signals to obtain a third composite signal for transmission[[.]] by the second antenna element during the first transmit period;

applying the fourth phase to the third component signal to obtain a <u>seventh</u> [[fifth]] signal;

applying the third phase to the fourth component signal to obtain [[a sixth]] <u>an 8th</u> signal; and

combining the fifth signal and the sixth signal to obtain a fourth composite signal for transmission by the second antenna element during the second time interval.

29. (New) A method of encoding information symbols for multiple antennae transmission comprising the steps of:

determining a plurality of orthogonal codes;

estimating at least one autocorrelation of at least one channel; and

determining an amount of the beamforming relative to an amount of orthogonal coding and signals transmitted from the multiple antenna based upon the plurality of orthogonal codes and the at least one autocorrelation.

30. (New) The method of claim 29, wherein determining the plurality of orthogonal codes comprises determining a code matrix, and wherein each column of the code matrix is associated with one of the plurality of orthogonal codes such that the columns are orthogonal to each other.

31. (New) The method of claim 29, wherein estimating the at least one autocorrelation of the at least one channel comprises estimating at least one autocorrelation of at least one reverse link channel.

32. (New) The method of claim 29, wherein estimating the at least one autocorrelation comprises determining at least one round-trip delay associated with the at least one channel.

33. (New) The method of claim 32, wherein estimating the at least one autocorrelation comprises determining at least one autocorrelation of the at least one channel for the at least one round-trip delay.

34. (New) The method of claim 29, wherein determining the amount of beamforming relative to the amount of orthogonal coding comprises accessing a lookup table.

35. (New) The method of claim 29, comprising encoding at least one symbol using the determined amount of beamforming and orthogonal coding.

36. (New) The method of claim 35, comprising transmitting the at least one encoded symbol using the determined amount of beamforming and orthogonal coding.